IL-90-08

Monsanto

LAW DEPARTMENT

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May 14, 1982

Robert G. Kuykendall, Manager
Division of Land and Pollution Control
Illinois Environmental Protection Agency
2200 Churchill Road
Springfield, Illinois 62706

Dear Mr. Kuykendall:

Re: Monsanto Company, W. G. Krummrich Landfill

This response is to the Illinois Environmental Protection Agency's (IEPA) request for information contained in Mr. Constantelos' letter to Mr. J. W. Molloy dated April 16, 1982. My review of section 4 of the Illinois Environmental Protection Act, Ill. Rev. Stat., ch. 111-1/2, section 1004, cited in the letter, indicates that the IEPA lacks authority to require submission of the information requested. However, without waiving any objections to IEPA's assertion of authority, Monsanto, in the spirit of cooperation, is providing this response to IEPA's request.

The term "Krummrich landfill," refers to a closed sanitary landfill identified as the W. G. Krummrich landfill in its 42 U.S.C. section 9603(c) notification and Illinois Pollution Control Board Rule 318(c) submission (Exhibit 1). Reference to materials deposited in the sanitary landfill or materials is defined to mean some or all of the material remaining after the manufacturing of product by Monsanto Company.

Much of the information requested has already been provided in documents filed earlier with the EPA and/or the Illinois Environmental Protection Agency (IEPA). In the event these documents are not readily available to you, I have enclosed copies and reference such as exhibits.

A review of available records does not present a uniform continuity of information. As you know, governmental recordkeeping requirements are of relatively recent origin. In their absence, records maintained reflect the specific determination by various departments of their own specific needs. Once these needs had been fulfilled, such records were disposed of. In any event, Monsanto like other major corporations and, indeed, the state government itself, follows a Records Management Manual which

requires periodic review of files and disposal of records no longer needed. Therefore, much of the information requested is no longer available. Included herein is information concerning the volume and type of material in the Krummrich landfill, information relevant to the clay cap of the landfill, a discussion of Monsanto investigation and work at the landfill, and Monsanto's present course of action.

Information reflecting Monsanto's analytical methodologies used in analysis of data from the November 12, 1981, sampling by EPA, and the IEPA split with Monsanto, is not included herein. It is Monsanto's opinion that a technical discussion of Monsanto practices is appropriate for a meeting of technical persons and submission of written information is outside the authority of IEPA to request and also inappropriate. Furthermore, Monsanto's dedication to developing the highest level of sophistication in its chemical analyses has resulted in its development of proprietary information in this field which Monsanto intends to maintain as confidential.

In a historical context, the Krummrich landfill is a closed and clay capped sanitary landfill on Monsanto property adjacent to and between an idle non-Monsanto landfill and a parcel of land which itself is adjacent to the Mississippi River. The Krummrich landfill began operation about 1957 and operated continuously without significant change until 1973. During this phase of operation, the landfill received various wastes from Monsanto Company operations. What records that may have been kept have since been destroyed, consistent with Monsanto's Records Management Manual.

In 1979, pursuant to a request made by Rep. Robert Eckhardt of the U. S. Congress, information was gathered concerning waste disposal practices during the period 1950 through 1978. As requested, where records were unavailable, some reliance was placed upon recollections of long-time employees. Therefore, the resulting compilation of data depicts a best guess at what volume and character of wastes were probably deposited in the landfill during its operating existence. This information concerning the Krummrich landfill was provided to the IEPA Division of Land and Noise, and a copy is attached hereto as Exhibit 2.

Interviews with plant personnel indicate that in the late 1960's through early 1970 representatives from the State of Illinois made periodic visits to the landfill and took samples from its monitoring wells. In addition, it is our belief that monitoring results from these wells were sent to the IEPA by Monsanto. A copy of one such transmittal is enclosed for your reference (Exhibit 3). These sample results showed little significance and after some period of time the State representatives ceased their sampling activities and Monsanto stopped its monitoring program.

On or about July 1, 1970, the Illinois Environmental Protection Act was passed prohibiting refuse collection and refuse disposal operations, except for refuse generated by the operator's own activities, without a permit granted by the IEPA. The Krummrich landfill site fell within the Title 5, Section 21(e) exemption and was not required to obtain a permit from the State of Illinois (Exhibit 4). On July 27, 1973, Illinois Pollution Control Board promulgated Rules and Regulations for solid waste.

Monsanto's practices comported with the new regulations. Attached as Exhibit 5 is a list of materials deemed to be appropriate for disposal under the newly promulgated regulations. The list (Exhibit 5) was provided to representatives of the Collinsville Land Pollution Control Surveillance Office and the Springfield Land Pollution Control Section on October 24, 1975, during a visit, on that date, to the W. G. Krummrich Plant. Memoranda suggest that the representatives were to return on October 28, 1975, to collect water samples from five landfill test wells as had been done on several prior occasions. Data from this possible return to resample wells is not present in Monsanto files.

From review of Monsanto's files, we find that information on the location of these five wells and three sets of well data were provided to Illinois pollution control officials (Exhibit 3). Monsanto's records, presently identified as applicable to the request for information, do not contain any other data from these wells.

The Krummrich landfill was operated from the required compliance date in 1974 until 1977 consistent with the new regulations. In 1977 Monsanto voluntarily ceased operation of the landfill and began closure. This voluntary closure was not in anticipation of EPA or IEPA regulations or possible adverse actions by either, but was conducted to insure proper securing of the landfill consistent with technology and expertise at the time.

Late in 1976, in compliance with Rule 318(b), Monsanto determined to utilize an outside consultant to address the proper method of closure and securing the landfill to minimize its effect, if any, on the environment. The consultant, D'Appolonia Consulting Engineering, Inc., was retained by Monsanto in August 1977 for an in-depth investigation of the landfill and recommendation of the method for closure. As part of the investigation, 19 test wells were drilled and geologic and hydrologic data was obtained and analyzed. As a result of this investigation, D'Appolonia recommended the landfill be covered with a clay cap. Monsanto immediately began work on installation of the clay cap (Exhibit 6).

The IEPA conducted several visits during this period of closure and monitoring. Several wells were sampled with bailers, and resistivity tests were conducted on the landfill. Monsanto does not know the results of these tests.

In April 1981, Monsanto became suspicious that test well data being obtained from the test wells installed by D'Appolonia was non-representative of the actual groundwater quality. At this time, a Monsanto hydrogeologist became involved with the sampling program and methodology of sampling. Empirical tests of water level response on the wells during 1981 indicated the wells were of little, if any, use.

Monsanto's conclusions were that these test wells had failed because of test well materials of construction and lack of proper development of these test wells. The well screens are believed to be damaged and the test wells are filled with sediment and cannot be re-developed. As a result of the above, and the fact Monsanto is dealing with a confined acquifer system, an essentially stagnant fluid is trapped within the steel casing above the sediment filled screened zone. Furthermore, it has been determined upon review that sampling procedures used with these wells were improper. The sampling procedures involved the use of a bailer to obtain a sample of the static fluid. The test wells were not purged prior to sampling, therefore, a stagnant sample was obtained. It is Monsanto's opinion that the stagnant sample is not representative of the water quality within the acquifer at any given time. Stagnant wells are very susceptible to higher concentration of lighter fractions within the potential suite of contaminants that may be present. Additionally, it is believed that the sampling bailer was not flushed adequately between obtaining samples between wells, which undoubtedly led to cross contamination.

In October 1981, Monsanto was advised by the IEPA of seepage observed and sampled by IEPA during September at a remote beach at the Mississippi River's edge on property owned by Monsanto. Monsanto, in cooperation with the IEPA and the EPA, obtained split samples (obtained in November 1981) with the EPA. The results were submitted to EPA and IEPA on March 30, 1982 (Exhibit 7).

In late December 1981, Monsanto retained Law Engineering Testing Company to drill and install 2" test wells at Monsanto's direction in the land area between the Mississippi River and Monsanto's landfill. Monsanto then retained D'Appolonia to install, at Monsanto's direction, 4" test wells within the landfill proper. This activity took several months and is nearing completion.

Monsanto is presently negotiating with an engineering company in connection with a geohydrologic investigation of an area adequate to evaluate any impact of the Krummrich landfill on the environment. Since these negotiations are still in progress, and it is possible the work may be let or performed on a different basis, confidential treatment of this information is requested. The investigation will involve a literature search and review; existing test well development; in situ and laboratory permeability tests; conducting pH, conductivity, temperature and total organic carbon tests; and measurement of water levels. Monsanto anticipates the program to begin mid-summer 1982. Upon completion of the above, Monsanto will be in a position to evaluate what, if any additional work may be necessary.

In November 1981, Monsanto requested a technical meeting to review the analytical results of the split samples. A meeting with EPA and IEPA occurred in March 1982. At this meeting Monsanto's results of analyses of the split samples were presented. In addition, Monsanto presented results from sampling the Mississippi River upstream and downstream of Monsanto's river property. This data clearly indicates the absence of any negative impact to the environment or health.

Sincerely,

Brent J. Gilhousen
Environmental Attorney

jf

cc: J. W. Molloy

Enclosures

seemed "non-hazardous", he stated that the Agency would "probably" officially notify us that we were being cited for disposal of hazardous wastes in an un-authorized (no permit issued) site, and furthermore that they would under no circumstances issue a permit for this site. To this I replied that Monsanto had reviewed each item on the landfill list in detail to insure that it was "non-hazardous", and would not prohibit us from operating the landfill under the permit exclusion clause in the Illinois Act.

e) Mr. Montgomery offered to discuss alternate landfill sites which would be acceptable to the Illinois EPA. We agreed that this would be best done at a later date.

f) The EPA will be collecting water samples from the landfill test wells on Tuesday, October 28, 1975. This has been done on several other occasions.

The meeting ended on a positive note. Mr. Montgomery stated that he would review our situation, and discuss his decision with me prior to taking any action. He told me that no "crash program" would be enforced on us, but did not indicate any timing for activity on their point. He was very inconclusive at this point, and led me to believe that he was giving equal thought to approving our present operations.

At this point, I recommended that we continue to operate the landfill as we are presently doing, and take no action until further notice by the EPA.

Let me know if you have questions.

Robert L Harness

Robert L. Harness
Environmental Control
Wm. G. Krummrich Plant

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EXHIBIT 6

MINI-PROJECT DEFINITION REPORT

CEA 8250
WGK LANDFILL CLOSURE

W. G. KRUMMRICH PLANT

May 9, 1978

I. PROJECT SYNOPSIS

This project provides for closing and securing the WGK Landfill. It will be accomplished in accordance with the recommendations of the study completed on CEA 9278, WGK Landfill.

Detailed design was also completed as part of CEA 9278. Construction will be done under this CEA. It consists of hauling approximately 110,000 cu.yds. of suitable fill material to the site; grading this to obtain proper drainage and ditches; placing approximately 80,000 cu.yds. of select material to form a 2 foot impervious cap over the 25 acre area; and seeding to provide a grass cover to minimize erosion. Approximately 6,000 feet of chain link fence will be used to secure the area.

A construction bid package has been prepared and was issued to bidders on May 3, 1978 with bids scheduled by May 22, 1978. Minimal support time and material work will also be required. This is listed under IV Facilities Description below.

The project is estimated to require 23 weeks after approval for completion. Estimated final cost is $1.8M which will be funded as Retirement expense under a Plant Approval For Expenditure (PAFE).

II. PROJECT COMMITMENTS

A. PROJECT PURPOSES

The purpose of this project is to retire the WGK Landfill in accordance with the recommendations made by the consultant, d'Appolonia, of Pittsburgh, Pa.

B. LOCATION

The WGK Landfill covers 25 acres on the west end of the W. G. Krummrich Plant.

C. EXPECTED COST RANGE

The project will cost approximately $1.8M of Retirement Expense funds.

D. EXPECTED TIMING

Design is complete. A unit price/lump sum bid package for most of the work has been issued and bids will be received on May 22, 1978. It is estimated that the contract can be awarded on June 1, 1978 or as soon thereafter as the PAFE is approved. The preliminary schedule indicates that mechanical completion will be 23 weeks after approval. It is essential that construction start as early as possible to insure a good stand of grass before the winter of 1978 to minimize erosion.

Approximately $5,000 pre-approval funds will be requested to perform preliminary site preparation.

These funds are desirable to have the area ready so the lump sum contractor can move in expeditiously and will minimize schedule slippage.

III. PROJECT RISKS

A. ESTIMATE

1) Estimated Final Cost can be increased if the landfill settles appreciably during compaction of the fill.

2) Additional funds for repairing erosion will be required if a good stand of grass is not obtained before cold weather in the winter of 1978 - say November.

3) $50,000 in Undeveloped Design have been earmarked for provision of dike walls on the east and north of the tank farm located at the northwest corner of the landfill. This was a last minute request of the plant. These funds may not be sufficient when detailed design is finished. Detailed design of these walls would have delayed the project. If funds are not sufficient, a variance will be processed.

IV. FACILITIES DESCRIPTION

A. See Annex A, Landfill Closing Specifications, Drawings, and Quantity Take Offs, 5/1/78, CEA 9278.

B. Cross section of area to establish basic elevations before contractor moves in.

C. Raise 19 each 2" and 2 each 6" standpipes in landfill two feet above finished grade and cap.

D. Remove 50 feet of 6" buried and five hundred feet of surface laid fire water line in landfill and cap.

50' of 7" ABOVE GROUND

E. Undeveloped design $50,000 (estimate) to provide approximately 700 feet of 0 to 6 feet high dike wall on east and north of tank farm in northwest corner of landfill. This will now be required to prevent tank spills from flowing into the drainage ditches on the west of the landfill.

F. Reroute 12 poles in electrical utility line on east side of the landfill.

ATTACHMENT 1

LANDFILLS

The W. G. Krummrich Plant does not operate a landfill at the present time. Four separate landfills have been used in the past. These are listed below along with a description and location of each. This information is based on available drawings and documentation.

1) Old Dump - Located at the site of existing plant storeroom and the adjacent area. 1942 plant drawing shows that this landfill was closed and filled-in by that date. Approximate size of the landfill is 150' X 175'. The landfill was used primarily as a disposal site for Nitrochlorobenzene waste.

   During a sewer construction project, some waste drums were uncovered in this landfill area. They were found to contain 2-Nitrobiphenyl and 4-Nitrobiphenyl. All unearthed drums were removed from the project area and will be incinerated at an approved disposal site.

2) New Dump - This closed landfill is located at the site of Bldg. BBK in the southwestern portion of the plant. This landfill is approximately 75' X 100' and had been in operation at least through the years of 1942 to 1951.

3) Phenol Residue Dump - This closed landfill is located on the western side of the plant approximately 400 ft. due north of the (2) above-mentioned landfills. The landfill encompasses an area of 75' X 100' and primarily contains residue from the now-extinct Phenol Department. The landfill was in operation in 1942 and the best available data indicates that it was closed before 1951.

4) Lot F Landfill - This landfill is located on W. G. Krummrich Plant property west of State Route 3. A 1946 drawing indicates that a landfill approximately 42' X 248' with a maximum depth of 18 ft. contains 5260 drums from the Nitrochlorobenzene Dept. Alleged contents of the drums include Orthonitrochlorobenzene and Dinitrochlorobenzene waste residue and drainings. Preliminary sampling of drums in the landfill indicate that some contain 2-Nitrobiphenyl and 4-Nitrobiphenyl.

In addition to the above, it is suspected that some undocumented landfill activity occurred near the site of the BBU Warehouse (RCRA waste container storage area). Two abandoned tanks containing solid hazardous constituents were unearthed in this area during the excavation for a plant project.

The items listed above are based on the best information available to date. This document supercedes all previous submittals and this information indicates the nonexistence of some landfills listed on the Part A document. No evidence or documentation to date has substantiated the existence of those landfills.

SURFACE IMPOUNDMENTS

At this time, there are no surface impoundment facilities in operation at the W. G. Krummrich Plant. Best information indicates the past existence of 3 individual surface impoundments or ponds, the most recent being 1951. Each of these impoundments are described below:

1) Discharge Pond - This pond was utilized by the Sulfuric Acid Department at least through the years of 1942 to 1951. No information or records are available pertaining to the material discharged into the pond. The pond was located on the western side of the plant and has an approximate size of 125' X 125'.

2) Sulfate Pond - Located on the western side of the plant. This pond contained sodium sulfate and was in operation at least through the years of 1942 to 1951. Approximate size of the pond was 300' X 75'.

3) Old Pond - This pond is also located on the western side of the plant, immediately to the south of the Sulfate Pond. The pond has approximate dimensions of 375' X 75' and was closed and filled in by at least 1942. No information or records are available on the contents held within the pond.

LAND FARM - Not applicable

WASTE PILE

Only one waste pile has been identified as being operational at the W. G. Krummrich Plant. This is the Chlor/Alkali solids waste pile which is presently in operation but is in the process of being closed in accordance with RCRA requirements. The RCRA Part B application refers to the waste pile closure. For additional information in regards to this closure, refer the RCRA Part B document which has been submitted to the Federal as well as the Illinois EPA offices. The closure date is scheduled for November of 1985.

The waste pile storage area is approximately 48' X 51' and is located in the eastern section of the plant. The waste pile contains SO_3, SO_4, and PO_3 salts, and mercuric compounds. Leachable mercury is approximately 10 ppm.

The waste pile has been in operation since 1974. Records are available for solids disposal from the waste pile and date back to 1981. No data or records are available for years previous to 1981.

Waste disposal data from the solids waste pile is listed below.

YEAR	WASTE DISPOSED (KLBS)
1981	900
1982	800
1983	780
1984	1150

The EPA regulated maximum solids inventory of the waste pile is 40 $yd.^3$ or approximately 108 Klbs.

INCINERATOR

Only one incinerator has been in operation at the W. G. Krummrich facility. It was opened in 1971 and closed in 1977. A total of 151,000 tons of organic waste was incinerated at this unit during that time period. These organics included:

1) Chemical Intermediates
2) Halogenated Aromatics
3) Polychlorinated Biphenyls
4) Plasticizers
5) Polar Solvents
6) Halogenated Aromatic Solvents

The incinerator was dismantled after its 1977 shutdown. It was located in the midwestern portion of the plant property. At this time there is no incinerator in operation at the W. G. Krummrich facility.

STORAGE TANKS (ABOVE GROUND)

A number of above ground tanks at the W.G. Krummrich Plant are used to store waste material containing a hazardous waste or hazardous constituents. The tanks which are currently in service for the storage of these wastes are described in this section. The tank's contents is also described along with any available waste disposal rates. All storage tanks containing RCRA hazardous wastes have been omitted from this report and information regarding these vessels can be found in the RCRA Part B application for this facility.

Listed below are the waste storage tanks which our best available information indicates hold or have held hazardous waste or hazardous constituents and are not included in the RCRA Part B application:

1) Condensate Tank (Dept. 222 Item No. 612). Waste material stored in this 4700 gallon vessel contains paranitroaniline refinement distillate. The carbon steel tank has the dimensions of 9.5' X 9' OD and is presently in use. Contents of the tank are:

   A) Paranitrochlorobenzene
   B) Paranitroaniline (A listed hazardous constituent)
   C) Nitrochlorobenzenes

Yearly disposable rates of the waste is shown below:

	Waste Disposed (K-lbs.)
1981	200
1982	150
1983	100
1984	40

2) Residue Tank (Dept. 237, Item No. 210). The residue tank contained waste generated from an elementary neutralization process and was shutdown and dismantled in 1983. The tank contained listed hazardous constituents. Total contents of this vessel were estimated to be:

70% - Dibenzyl P-Chlorophenol

30% -
- P - Chlorophenol
- O - Chlorophenol
- Phenol
- O - Benzyl - P - Chlorophenol
- Isopropyl Alcohol
- Other Hiboilers

The quantity of waste disposed from this tank is outlined below.

	Water Disposed (K-lbs.)
1981	1750
1982	1800
1983	1000
1984	0

3) Benzyl Chloride Residue Tank (Dept. 229 Item 189). Residue from the Benzyl Chloride Distillation was stored in this 14000 gallon vessel. The 17' X 12' OD vertical, FRP tank was diked and monitored per RCRA requirements. This tank, which is no longer in service, was shutdown and dismantled in 1982. This vessel did contain listed hazardous constituents. Typical composition of this listed waste (K015) is shown below:

75% Benzal Chloride
15% Benzyl Chloride
10% Hiboilers

4) Steamer Overhead Tank (Dept. 238, Item No. 407). This 15,000 gallon, FRP tank was regulated by RCRA. In 1982 the tank was was shutdown and taken out of service. The diked horizontal vessel was 14'-6" X 12' OD and stored an ignitable waste (D001) generated from the distillation of butyl benzyl phthalate and includes listed hazardous constituents. The waste material was composed of the following substances:

Butanol
Benzyl Chloride
Triethylamine

STORAGE TANKS (UNDERGROUND) - Not Applicable SEE PG 10

CONTAINER STORAGE AREA

One container storage area for waste has been identified for the W. G. Krummrich Plant. This is described in this section. The BBU Warehouse is also a container storage area but is not included since it is described in detail in the RCRA Part B application for the plant.

PCB WAREHOUSE - This container storage area was opened in 1979 and remained in operation until 1982. Shortly thereafter it was dismantled and the waste disposed of in accordance with EPA regulations. The last shipment of waste to the warehouse was in November, 1981. The warehouse was located on the central west portion of the plant.

Waste material stored within the warehouse contained PCB's (Polychlorinated biphenyls). Year end inventory of the PCB Warehouse is shown below:

	PCB Waste (K lbs)
1979	361
1980	634
1981	1063
1982	0

INJECTION WELLS - Not Applicable

WASTEWATER TREATMENT UNIT

The W. G. Krummrich Plant has one wastewater treatment unit that pretreats industrial wastewater before it is sewered to the Village of Sauget Wastewater Treatment Plant. This in-plant treatment facility services all wastewater for mercury removal within the Chlor/Alkali Department. It is permitted by the Illinois EPA under the Federal Clean Water Act of 1977. Its permit reference number is 1984-EP-2981.

The plant is in full compliance with this permit. Under the permit, the daily average flow of 130,000 gallons, and a daily maximum flow of 216,000 gallons, is discharged into the sewer system of the Village of Sauget. Mercury discharged by this facility shall not exceed an average of 0.25 lb/day during any calendar month and a maximum of 0.5 lb/day during any one day.

The Chlor/Alkali wastewater treatment facility reduces the mercury level by a two-step process involving a clarifier and reactor along with additional pieces of auxillary equipment and vessels. The clarifier is 35' ID X 13'9" deep while the reactor is 12'0" ID X 13' tall and has an 11,000 gallon capacity. Solids collected from the wastewater treatment are RCRA hazardous wastes and are included in the plant's RCRA Part B application.

TRANSFER STATIONS - Not applicable

WASTE RECYCLING OPERATIONS - Not applicable.

WASTE TREATMENT, DETOXIFICATION

One waste treatment, detoxification unit is in operation at this plant. It involves the treatment of cellhouse brine solids for the removal of leachable mercury before it is disposed in an EPA approved landfill. This waste solids treatment has been in operation since 1980. Major process features include a 3000 gallon reactor and a specially designed 22'8" X 6'11" X 4'9" high roll-off metal treatment box which has a capacity of 27 yd^3.

The treated solids are in full compliance with the EPA regulated mercury limit of 0.05 PPM (Based on a temporary delisting specification) before it is disposed at a Class II landfill. Annual disposal rates for this solid waste is shown below:

	Waste Disposed (K-lbs)
1981	900
1982	300
1983	370
1984	252